

CURRENT PRACTICES IN INJURY PREVENTION AND SAFETY HELMET USE
AMONG HEAD INJURY PATIENTS IN AN ARMY OUTPATIENT CARE SETTING

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ABSTRACT

It has been estimated that 90,000 deaths related to unintentional injuries occur in the United States each year. Among the unintentional injuries, head injuries were a major contributor to injury-related mortality and morbidity. The purpose of this research was to investigate the current practices involving head injury prevention in Army outpatient care settings. This study used a descriptive quantitative design to examine whether primary care providers in two Army outpatient care settings provided counseling on safety helmet use involving individuals with a sports related head injury. Active duty soldiers and beneficiaries between the ages of 18-44 years were selected for study inclusion in order to coincide with the army population. A total of 607 medical records were reviewed using a checklist developed by the researcher. Fifty-one records met the criteria for inclusion in the study and 15 of the medical records were related to sports injuries. Only two of the records contained documentation of head injury counseling at the time of treatment for the head injury. Primary care provider s awareness of preventive counseling is encouraged to optimize the health and well being of our military population today.

Key Words: **injury prevention counseling, unintentional injuries, head injury, safety helmet use, primary care provider**

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HELMET USE AMONG HEAD INJURY PATIENTS
IN AN ARMY OUTPATIENT CARE SETTING

by

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PREFACE

This research was conducted to provide information on the current practices in injury prevention and safety helmet use among head injury patients in a military treatment facility. It was designed to encourage healthcare providers to counsel patients on the use of safety helmets and preventing head injuries.

DEDICATION

I want to thank my family for their wonderful support during these two years of graduate school to include writing my thesis. I especially want to thank my husband, Jim, my two sons, William and Alexander, and my parents, Barbara and Landy Nelson for all their love and encouragement during the most challenging moments of my studies.

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CHAPTER I: INTRODUCTION

Background

Health promotion and disease prevention are the focus in a national effort to improve the health of Americans. The specific sets of challenges defined in Healthy People 2000, and the mid course review published in 1995, provided a strategic vision for this significant health improvement goal. With the communication of Healthy People 2000 objectives, health care providers have shared goals with target dates (U.S. Department of Health and Human Services Public Health Service, 1992). In addition, Healthy People 2010 (Office of Disease Prevention and Health Promotion, 1997), the nation's prevention agenda of goals and objectives for the first decade of the 21st century, built further on the prevention framework. The Healthy People 2010 goals to Increase Years of Healthy Life (p.1) and Eliminate Health Disparities (p.1) have pointed the way toward creating a much more efficient and equitable healthcare system. Both the Healthy People 2000 and Healthy People 2010 agendas were supported through increasing the scope of health care to include promoting healthy behaviors, protecting health, achieving access to quality health care, and strengthening community prevention. The stage was set for a proactive health campaign.

A major goal of this campaign was a significant reduction of unintentional injuries. Unintentional injuries account for 90,000 deaths in the United States each year. In fact, they were the leading cause of death for persons under 45 years (Office of Disease Prevention and Health promotion, 1998), and injuries are the leading

cause of potential life lost before age 65 (Woof, Jonas & Lawrence, 1996, p. 233). Among the unintentional injuries, head injuries were a major contributor to injury-related mortality and morbidity. Head injuries accounted for more than 50,000 deaths annually (Mock, Maier, Boyle, Pilcher, & Rivara, 1995). Despite these statistics, many practitioners believed that the prevention of injuries fell outside of the scope of their practice (Woof et al., 1996). The U.S. Department of Health and Human Services disagreed and suggested that many patients would benefit from counseling to modify their injury prone behaviors (DHHS, 1998).

Statement of the Problem

One of the objectives of Healthy People 2000 was to encourage safety helmet use. Head injury is the leading cause of death in motorcycle and bicycle crashes (PHS, 1992, p.283). This objective reflected the need for public awareness on safety issues related to the importance of helmet use. Counsel all patients to wear safety helmets while operating or riding motorcycles or bicycles (DHHS, 1998, p. 392).

A safety helmet approved by the American National Standards Institute (ANSI), Snell Memorial Foundation, or the American Society for Testing Materials (ASTM) should be worn by all persons every time they ride or are a passenger on a bicycle. Helmets should also be worn while using roller skates, in-line skates, and skateboards (DHHS, 1998, p.152). In general, helmets were to be used whenever a risk of head injury existed and where they were appropriate to reduce mortality. It is

hypothesized that, in general, counseling on head injury prevention is provided significantly less frequently in the primary care setting than education on other risk behaviors related to heart disease, diabetes, smoking, cancer, alcohol and sexually transmitted diseases (Diamond & Macciocchi, 1998, p. 817). Primary care providers were encouraged to educate their patients on preventive health care practices, providing counseling and education involving head injury. Injury prevention counseling determined and communicated the most likely risk of injury to the individual (Woolf, et. al., 1996). If done frequently and consistently, this may lead to improvement in reducing risk and prevalence of head trauma.

Primary care practitioners have a unique opportunity to counsel and educate patients to adopt preventive behaviors. The U.S. Department of Health and Human Services recommended that questions about safety issues be asked on questionnaires, significant issues be entered on the patient problem list, and any counseling interventions be documented. Once behaviors are documented, health care providers can modify their counseling to the patient's needs and even provide positive feedback. Counseling about unintentional injury prevention should be part of the evaluation and counseling on bicycle, motorcycle, in-line skating and skiing helmet use which was recommended by the American Academy of Family Physicians (PHS, 1992).

The need to prevent head injuries can be an important preventive health care practice for the active duty military as it strives to maintain a readiness for active duty soldiers. According to the U.S. Army Surgeon General, the mission of Army

readiness is to have a healthy and protected force. To ensure a highly deployable military, soldiers need to be in a state of optimal health and be protected against disease and injury (U.S. Army Medical Command, 1998). Injuries create problems in lost productivity and inability of the active duty soldier to deploy. In 1995 the Department of Defense (DoD) surveyed the health-related behaviors of military personnel to see how they compared to Healthy People 2000 objectives (PHS, 1992). Approximately 3,400 active-duty military personnel were hospitalized for treatment of any injury in the past 12 months, a number that was about 4.5 times higher than the Healthy People 2000 target of 757 per 100,000 people (DoD, 1998).

A recent survey identified that approximately 70% of active-duty members who rode motorcycles always or nearly always wore helmets. This rate was lower than the Healthy People 2000 objective (PHS, 1992) of increasing helmet use to at least 80% of motorcyclists. Among bicyclists in the past 12 months, rates of regular helmet use (i.e. always or nearly always) were all below the Healthy People 2000 objective of 50%. One in five (22.8%) active duty personnel who rode a bicycle in the past 12 months wore a helmet (DHHS, 1998). Findings from this DoD survey suggested that additional effort in the use of safety helmet use was needed to meet Healthy People 2000 objectives.

Statement of the Purpose

The purpose of this study was to examine the current practices in head injury prevention and counseling among active duty patients and beneficiaries between the ages of 18 and 44 years in Army outpatient care settings. The researcher examined

whether providers counsel on safety helmet use during an outpatient visit to any persons involved in a sports related head injury.

Research Questions

Based on review of the literature the following research question was proposed: What are the current practices in head injury prevention counseling among primary care providers in an Army outpatient care settings when treating active duty patients and beneficiaries with a sports related head injury? To answer the main research, the following additional questions were posited:

1. What sports related activity was the individual involved in when he or she received the head injury?
2. When did the head injury occur?
3. Was the individual wearing a helmet when the head injury occurred?
4. What was the age of the individual when the head injury occurred?
5. Was there documentation of injury prevention counseling in the outpatient record between 1 January 1998 to 30 June 1999?
6. What type of provider (Registered Nurse, Advanced Practice Nurse, Physician s Assistant, Medical Doctor, Doctor of Osteopath) documented injury prevention counseling involving the head injury patient?
7. How many opportunities for counseling after the head injury occurred did the provider have with the head injured patient?
8. How many times was there documentation of injury prevention counseling following the head injury?

9. What type of setting did the counseling on head injury prevention occur?

Theoretical Framework

The Health Promotion Model (HPM) (Pender, 1996) was designed as a framework to predict overall health-promoting lifestyles and specific behaviors to facilitate health-promoting behavior. It was based on research findings from areas of health promotion and wellness behavior. The framework was offered as a guide for research of the psychosocial processes that motivated people to adapt behaviors directed toward the improvement of health and personal well being. The revised model was used to describe the nature of individuals interacting with their environment as they shaped and maintained health behaviors.

The HPM model included three categories: Individual Characteristics and Experiences, Behavior-Specific Cognitions and Affect, and Behavioral Outcomes. Each category represented variables and their interrelationships towards developing a particular health behavior. The outcome of the HPM was the health-promoting behavior. It was directed toward attaining positive health outcomes for the client. Health-promoting behaviors, especially those used within a healthy lifestyle, resulted in a positive health experience throughout the life span (Pender, 1996).

This study focused on the first two stages of HPM. These stages were designed to uncover Individual Characteristics and Experiences and promote Behavior-Specific Cognitions and Affect. Specifically, this study attempted to determine if a provider was:

- 1) Attempting to develop an understanding of the patient. Fostering a healthy behavior is a growing challenge in health care. The primary care provider must learn the best way to help patients adopt and sustain healthy attitudes and habits. Exploring the patient's level of understanding is important before talking to them about their behavior. Helping the patient to comprehend the relationship between behavior and health may be necessary. Once this approach has been taken, patients are most likely to make lasting changes in their behavior as if they become collaborators in their care (Woof et al., 1996).
- 2) Counseling the patient that certain at risk activities may lead to head injury. Individuals should receive special counseling about the importance of regular prevention strategies (e.g., safety helmets for motorcycle, bicycle, in-line skating and skiing activities) to decrease the risk of any form of head injury. Patients may be motivated to wear helmets if the primary care provider describes the lethal and disabling nature of high-impact head injuries and the efficacy of safety helmets (about 30% reduction in mortality and 75% reduction in head injuries) (Woof et al., 1996).

3) Convincing the patient that he or she can act to reduce the risk of head

injury. The helmet remains the most important strategy specifically designed for head injury prevention (Kraus & Peek, 1995, p. 880).

Counseling the patient is necessary so that she or he can actively adopt prevention strategies for injury prevention thus reducing the risk of head injury and death.

For this study, a program of the aforementioned provider intervention could take the form of a formal program, documented in medical records, or an informal program, verbal interaction only.

Conceptual and Operational Definitions

For the purpose of this study, the following definitions were used to define the variables to be measured:

Army Primary Care Provider

An individual with credentials and training to provide direct patient care and ongoing health promotion and disease prevention. For the purpose of this study, the Army primary care provider was defined as a MD, DO, APN, PA, RN with credentials and training to provide direct patient care in an Army hospital or clinical setting.

Army Outpatient Care Clinic

Military health care facility where patients are diagnosed and treated for minor illnesses, injuries, and disease processes. This includes primary care, family practice

and emergency room facilities. For the purpose of this study, an Army primary care clinic was defined as either an emergency room, family practice clinic or any outpatient specialty clinic in an army outpatient care setting.

Head Injury Patient

An individual who receives a traumatic injury to the head resulting from a sports related activity. For the purpose of this study, a head injury patient is an active duty military person who received a sports related head injury between 1 January 1998 and 30 June 1999 listed under the following ICD codes: 800-804 (skull/facial fracture), 850 (concussion), 851 (cerebral laceration or contusion), 873 (unspecified open wound of the head and 959 (unspecified head injury).

Health Promotion

Consists of activities directed toward increasing the level of well being. For the purpose of this study, health promotion was defined as promoting behaviors that reduce an identified health risk, including specific behaviors such as the use of safety helmets.

Injury Prevention Counseling

Interventions that address a patient's at risk activities and personal health practices to improve overall health practices. For the purpose of this study, documentation of injury prevention counseling confirmed the patient was counseled to wear a safety helmet and protective gear when involved in sports related activities.

Opportunities For Counseling

Describes a visit to an outpatient care setting when a provider has an opportunity to discuss at risk behaviors and promote a healthier lifestyle with the patient. For the purpose of this study, opportunities for counseling were documented visits to the outpatient setting by the head injured patient between 1 January 1998 and 30 June 1999.

Outpatient Medical Records

Records or charts of patients used to record and document diagnosis, medical history, treatment, prognosis and preventive counseling by primary care providers. For the purpose of this study, outpatient medical records served as the data source for the medical chart review.

Safety Helmet

A safety helmet approved by the American National Standards Institute (ANSI), Snell Memorial Foundation, or the American Society for Testing Materials (ASTM) should be worn by all persons every time they ride a bicycle, motorcycle, and while using roller skates, in-line skates, and skiing. For the purpose of this study, the primary care provider determined the adequacy of any helmet involved in sports related activities.

Sports Related Injury

An injury that occurs while participating in an athletic event. For the purpose of this study, a sports related injury was considered as an activity related to an athletic event.

Unintentional Injury

A sports related head injury received in an unanticipated occurrence. For the purpose of this study, a head injury was considered as an unintentional injury.

Assumptions

This study was based on the following assumptions:

1. Injury prevention counseling promotes a healthier lifestyle.
2. Army primary care providers were conducting injury prevention counseling.
3. Injury prevention counseling was documented in the medical record.
4. Injury prevention counseling documented by a primary care provider included counseling on protective gear, which included safety helmet use.

Limitations

The sample was specifically limited to active duty army soldiers and beneficiaries between 18 and 44 years of age. Unintended self reported injuries was one of the leading causes of death in this age group (DoD, 1998). The records included persons who sought their health care in the military health care system. Records were reviewed from Army health care facilities.

CHAPTER II: LITERATURE REVIEW

Introduction

The purpose of this study was to evaluate preventive care for head injuries among active duty soldiers and beneficiaries. This chapter reviewed the most pertinent literature and published studies regarding preventive care both in general and specifically for head injuries. Sources reflecting the general need for preventive care were numerous and have been increasing in frequency. Literature regarding the general movement to participate in preventive health care included: literature backing up the hypothesis that preventive health care is a valuable tool in the effort to reduce medical costs and improve general health, and literature that a primary care provider can be effective in influencing patients to change a specific behavior. Studies dealing specifically with head injury prevention were few, but provided a foundation supporting the adoption of preventive health measures. This foundation consisted of: studies which quantify the effectiveness of counseling on the reduction of head injury occurrence, and studies that quantify the existence of head injury counseling programs.

Preventive Health Care as a Tool for Change

The establishment of preventive care as a tool to combat injury is a work-in-progress. The vast majority of the literature examined in the preparation of this study followed a predictable path. First, the literature overwhelmed the reader with statistical information on the frequency of present and past injury. Then, the authors sought to find solutions to reduce these numbers. As a conclusion, the literature

suggested an adjustment in our health care philosophy, calling for an effort to explore the effectiveness of preventive care. The best and most extensive examples of this effort was to convince health care providers of the need for preventive medicine, which are the Healthy People 2000 and Healthy People 2010 (ODPHP, 1997) public policies. Healthy People 2000 (PHS, 1992) objectives were designed with the help of 3,000 organizations around the world and received the input of over 10,000 individuals. The main benefits of these public policies have been to establish baseline numbers and to monitor progress toward goal attainment over time. The data collection that generated the baseline numbers were immense. By establishing health categories (differentiated by age and special population status), the information laid the groundwork for present and future studies to determine the relative effectiveness of different health care program philosophies on the populations studied. With this information in place, the likelihood of empirical data on cause-effect relationships may be examined in the future.

Both Healthy People 2000 and Healthy People 2010 suggested a community-wide effort to make progress towards advancement of health promotion and disease prevention. Implementation of these two areas was the central challenge of these two policies. The purpose of Healthy People 2000 was to have our nation attain three broad goals: increase the span of healthy life for Americans, reduce health disparities among Americans, and achieve access to preventive services for all Americans (PHS, 1992, p.6). The primary care provider is a major player in this effort to prevent the diseases and conditions that result in early death and ongoing disability. The

policy admitted that the support/ incentive to achieve these goals and objectives was not presently in place. Achievement of the agenda set forth depended heavily on changes in individual behaviors. Also, the policies did not quantify the level of interaction by providers.

The Healthy People 2000 and Healthy People 2010 documents (PHS, 1992) identified the problem but fell short of establishing any cause-effect relationships between programs of preventive care and improved health outcomes. The lack of empirical data regarding the preventive health care hypothesis was understandable. First, the movement toward health prevention was in its early stages. Second, there were few incentives to provide preventive health care, as organizations were not inclined to redirect their limited resource from acute care to preventive care. Not surprisingly, providers have not adopted spending time and money up front in an effort to reduce long-term costs.

Finally, the highest hurdle for researchers was the fact that empirical studies on injury prevention faced the difficult task of determining which factors affected change. Researchers must: a) focus on a single variable to be tested, b) develop a hypothesis assuming a relationship exists between the dependent variable, and c) attempt to isolate the variables effect an achieving a desired event. This process was complicated in a field environment as there were numerous uncontrolled factors that affected behavior.

Injuries constitute one of several of our most expensive health occurrences. The costs, including direct medical care and rehabilitation, lost income and

productivity, have been estimated at greater than \$224 billion annually (DHHS, 1998). Every bicycle helmet saves the country \$395 in direct medical costs and other costs to society (DHHS, 1998, p. 7). In the United States, the cost of an approved helmet ranges from \$15-30 dollars. The DoD Survey of Health Related Behaviors (1998) found that in 1995, approximately 3,400 active-duty personnel per 100,000 had been hospitalized in the past 12 months for treatment of an injury. This rate was 4.5 times higher than the Healthy People 2000 objective of reducing injuries requiring hospitalization to no more than 754 per 100,000 persons. Overall hospitalizations for injuries for those in the Army were 5,002 per 100,000 active duty service members, and those in pay grades E1 to E3 were 4,863 per 100,000 active duty service members.

The Health Care Provider s Ability to Influence

There are many studies on the ability of one individual to influence another person s behavior. In fact, it is universally understood that an educator is able to teach willing pupils. However, for successful education to occur, the motivational factors of the students needs to be addressed.

The study conducted in this thesis hypothesized that health care providers have the ability to motivate patients in much the same way as in the teacher-student model. If this were true, a health care provider would be able to initiate the adoption of injury prevention behaviors as a valuable resource in the effort to increase the general health of our society.

An effective teaching experience depends on understanding the process of motivating and influencing others. The Theory of Reasoned Action proposes that the behavior can be influenced (Ajzen & Fishbein, 1980). This framework was effective in identifying, refining and promoting behaviors. Pender uses cognitive-perceptual factors which act as primary motivational tools influencing health promotion activities (Pender, 1996). Health care providers' activities in prevention of injuries are explained by Nola Pender's theory identifying health-promoting behaviors integral to the individual's lifestyle. Pender describes cognitive-perceptual factors, which acted as primary motivational mechanisms influencing health promotion activities. These factors include perceived importance of health, perceived health control and self-efficacy, perceived health status, perceived benefits of the health promoting behavior and perceived barriers. Pender also acknowledges demographic characteristics, biological characteristics, and interpersonal and environmental factors, which motivate a person's health promotion decisions. Using this model, health professionals constitute a part of the interpersonal environment (of a patient) which exerts influence throughout their life span. (Pender, 1996, p. 55).

Head Injury Prevention Studies

Head injuries are a major contributor to injury related mortality and morbidity (Mock et al., 1995). These injuries have led to more than 50,000 deaths annually. An additional 50,000-60,000 head injury victims have been left with permanent disabilities each year. This makes head injuries one of the largest single contributors to trauma related disability. There are 67 million bicyclists in the United

States. Among these bicyclists, there were 500,000 bicycle-related injuries treated annually and approximately 900 deaths in bicycle-related injuries. One-third of the bicycle injuries treated in medical facilities were head injuries. Two-thirds of hospitalizations and three-fourths of bicycle related injuries resulted in death. One-third of all bicycle related brain injuries and 90% of bicycle fatalities were due to collisions with motor vehicles. In terms of serious morbidity, mortality, and long-term disability, head injuries are a major problem in bicycle-related trauma (Rivara, Rivara, Thompson, Patterson & Thompson, 1998, p.24).

Among injured motorcyclists, head injury is common. Motorcyclists were more at risk of being injured or killed as the rider lacked the protection of a closed vehicle (DHHS, 1998). Helmets are about 29 percent effective in preventing motorcycle deaths and about 67 percent effective in preventing brain injuries. A rider without a helmet is 40 percent likely to suffer a fatal head injury, compared with a helmeted rider (DHHS, 1998). In states that required motorcyclists to wear helmets, helmet use approached 100 percent, while states with partial or no laws reported much lower percentages of helmet use. Not surprisingly, head injury related deaths have been proven to be twice as high in states with no motorcycle helmet laws (DHHS, 1998).

Among in-line skaters, approximately one half of the in-line skating deaths were due to head injuries. The most common area for injury for in-line skaters was the hand and wrist region. However, helmets were important to skaters who could reach high speeds or who skated on downhill stretches (Young & Seth, 1998).

Although there have been advances in access to trauma centers and in the therapy of head injuries, much of the morbidity and mortality of head injuries continued even with such therapy (Mock et al, 1995). Injury prevention counseling was vital to decrease the impact of head injuries. Pre-injury preventive efforts needed to shift from post-injury treatment to decrease the severe head injuries that continued to exist.

Case control studies found that helmets were effective in preventing head and brain injuries (Rivera et al., 1998). Bicycle helmets decreased the risk of head injury by 85 percent and brain injury by 88 percent. The protective effect of helmets is present for all ages, and appears to offer as much protection in crashes involving motor vehicles as it does crashes without motor vehicle involvement.

Understandably, the scope of studies began at the most specific level (i.e. effectiveness of health counseling on head injury prevention in reducing head injuries) and expanded toward more general levels (i.e. effectiveness of primary care providers counseling on general patient health). The success or failure of a comprehensive general health prevention campaign was measured by the sum total of a multitude of studies designed to evaluate the progress of targeted preventive health care efforts.

Although fewer journal articles were found on head injury prevention, some studies provided empirical data on these injuries. Specifically, the Mock et al. (1995) and Diamond and Macciocchi (1998) further developed the environment for study of head injury prevention.

In 1995, Mock hypothesized a relationship between promotion of helmet use and the occurrence of head injuries. The findings of this study compared helmet use and head injuries before and after an extensive campaign to educate bicyclists and promote legislation of helmet use. Observed helmet use on 8,860 bicycle riders before the campaign was 5% compared to 62% after the campaign. Head injuries from bicycle and motorcycle use decreased from 20% before the passage of a helmet law to 9% of all level-one trauma admissions after passage of the law. The methodology used was to select a large sample of bicycle incidents before and after the campaign and to examine all admissions data before and after the legislation. The campaign methodology was designed to seek information on reasons for not using helmets and then conduct a campaign to combat these reasons. In addition to the persuasive efforts to promote helmet use, the campaign pushed for legislation. The dramatic results of this study demonstrated the importance of understanding an individual's perspective on helmet use prior to motivating through education. This study also indicated that public policy may be an effective tool as a motivating factor.

In the Diamond and Macciocchi (1998) study, an attempt was made to discover whether primary care physicians provided education and counseling on head injury as part of regular health care discussions with patients. The findings revealed that 80% of the physicians discussed bicycle helmet use with their patients. It was hypothesized that counseling on head injury prevention was provided significantly less frequently in the primary care setting than education on risk behaviors related to other disease states.

The educational and counseling practices of primary care physicians were studied using a survey method. The methodology included a preventive health care practice survey distributed to 678 physicians. The survey was described as a measure of general preventive health care practices. From the results, responses were received from 51% of those surveyed (n=342). Most responders were male (72%) and family medicine physicians. 58% of physicians reported providing some kind of preventive health care counseling while 37% said they commonly provided preventive health care counseling. Head injury was the less frequently discussed topic at (46%) compared to smoking at (97%). Finally, this study demonstrated that prevention strategies for head injury were discussed much less frequently than other health risks such as heart disease and cancer in the primary care setting. Injury is the leading cause of lost potential years of life in the United States (Robertson, 1992, p. 3). Strategies are needed to educate primary care providers on head injury in order to increase their efforts toward prevention.

The Army's focus on health promotion was traced back over fifty years to the beginning of World War II and the creation of the U.S. Army Center for Health Promotion. Today, this organization has been redesignated the U.S. Army Center for Health Promotion and Preventive Medicine. The Center's mission for the future is to provide worldwide technical support for implementing preventive medicine, public health and health promotion/wellness services into all of America's Army and the Army Community, anticipating and responding to operational needs in a changing world environment (U.S. Army Center for Health Promotion Preventive Medicine,

1999). With the mission of Healthy People 2000, the United States Army's Plan for Implementation of Put Prevention into Practice (PIIP) was initiated in October 1994. The goal: to bring prevention and health promotion into every patient encounter with either a visit or hospitalization. By establishing PIIP in the military, it was expected that the readiness of the force would increase and in the long-term would provide to be an effective and beneficial use of our health care resources. Each primary care provider would become educated on prevention and health promotion with at least 25 percent of his/her duty time dedicated to the PIIP program. One of the overall goals of the PIIP effort was to demonstrate the effectiveness of health promotion and wellness in managing the health risk to the service members, the beneficiaries and retirees. This policy was to improve and maintain military readiness and the quality of life of DoD personnel and other beneficiaries (U.S. Army Center for Health Promotion Preventive Medicine, 1999).

Summary

In conclusion, preventive care has been accepted as a valuable tool in the effort to improve general health. The primary care provider has been situated to influence patient health behavior. Studies on head injury suggest that prevention campaigns have been effective in both changing behavior and reducing the occurrence and severity of injury. However, studies also have shown that counseling on head injury prevention fell behind other health risk counseling. These factors suggest that additional studies

are needed to better define the relationship between preventive care counseling and the effect on head injury.

CHAPTER III: METHODS

Research Design

This study used a descriptive design to describe the current practices in head injury prevention counseling in Army outpatient care settings. Data were collected using a checklist developed by the researcher to assess for injury prevention documentation. Data were gathered retrospectively from outpatient medical records. The chart review examined sports related head injuries among active duty individuals and beneficiaries between the ages of 18 and 44 years.

Sample and Setting

The study was conducted at two Army medical treatment facilities with outpatient services. Active duty male and female soldiers and beneficiaries treated at the designated facility were identified.

The criterion for inclusion in the study included:

1. The individual was active duty in the military or a beneficiary with an outpatient medical record on file at Kimbrough Ambulatory Care Clinic (KACC) and Walter Reed Army Medical Center (WRAMC).
2. The treatment was provided in an Army outpatient care setting at KACC and WRAMC between 1 January 1998 and 30 June 1999. These dates were used to evaluate an increased effort in counseling for injury prevention following the release of the Department of Defense survey of healthy behaviors among active duty military

- personnel. The results from the survey recommended additional strategies to achieve Healthy People 2000 objectives (PHS, 1992) on safety helmet use.
3. The medical record was gathered using the Composite Healthcare System (CHCS) under the following International Class of Diseases-9th Revision-Clinical Modification (ICD-9-CM) codes: 800-804 -skull and facial fractures, 850-concussion 851-cerebral laceration or contusion, 873- unspecified open wound of head and 959- unspecified head injury.
 4. Patients ages at least 18 years and no greater than 44 years of age of either gender or race were included. This age range was selected because unintentional injuries are the leading cause of death for individuals under 45 years of age (Woolf et al., 1998).

With assistance from the patient administration personnel, a list of records meeting the inclusion criteria was generated using the Composite Healthcare System (CHCS) at an Army ambulatory care clinic and an Army medical center. A sample of 51 medical records meeting the inclusion criteria was reviewed within the medical facility and returned to the medical records section upon completion of data collection. Out of the 51 medical records reviewed, 15 records were included in the study.

Measurement

The Chart Review Checklist (Appendix A), designed by the researcher, was used as a data collection tool for this study. The purpose of the Chart Review is to determine whether the outpatient medical record of the active duty soldier or

beneficiary had documentation of injury prevention counseling related to a sports related injury on safety helmet use/protective gear. The Chart Review Checklist will consist of nine questions. The records of all active duty personnel and beneficiaries that received a head injury between 1 January 1998 and 30 June 1999, as identified by ICD codes 800-804, 850, 851, 873 and 959 were selected for review. The first question on the Chart Review Checklist determined if the head injury was related to a sport. If the head injury was not sports related, the review of the record was discontinued. If the head injury was sports related, data were collected on the following: type of sport the individual was participating in at the time of the head injury, date of the head injury, whether the individual was wearing a safety helmet at the time of the head injury, and age and gender of the individual at the time of the head injury. The next questions determine whether there was documentation of injury prevention counseling during any outpatient visit between 1 January 1998 and 30 June 1999. If yes, did the counseling occur before or after the head injury, who performed the counseling, and how many opportunities did the provider have for counseling on injury prevention with the head injured patient. The final questions determined how many times there was documentation of injury prevention counseling following the head injury and type of outpatient care setting in which the injury prevention counseling occurred.

To ensure content validity of this instrument, the checklist underwent a three-person expert review panel. The panel consisted of two Advanced Practice Nurse experts, a Physician and a Physician's Assistant. The expert review panel

individually rated each item on the tools on a 4-point rating scale with four defined as very relevant , and 1 defined as not relevant . Items, which were not measured as relevant by these four experts, were either revised or eliminated from the tool. A content validity index was then computed.

Once the validity of the checklist for the chart review was assessed, an estimate of intra-rater reliability was obtained through a pilot study of ten eligible medical records. Reliability represents the consistency of measure obtained (Burns & Grove, 1997, p.327). The intra-rater reliability method was used rather than the inter-rater reliability because only a sole researcher was collecting the data. The researcher using the checklist audited data from 10 outpatient medical records on two separate occasions two weeks apart. Consistency of data recording between the two occasions was compared using percent agreement. A percent agreement of 70 was accepted for this newly modified tool.

Protection of Human Rights

The study proposal was presented to and written approval received from the Institutional Review Board, Research Administration at the Uniformed Services University of the Health Sciences prior to the initiation of the study (Appendix B). Once this approval was obtained, approval to conduct the study at two United States Army medical outpatient care facilities was obtained in writing through the Internal Review Board at the Department of Clinical Investigation at Walter Reed Army Medical Center. Copies of each of the IRB approvals were provided to the Chief

Nurses at each of the two Army medical treatment facilities, and personnel in charge of the outpatient record sections prior to the review of medical records.

Actions were taken to maintain patient confidentiality and to protect the rights of the patients whose medical records were reviewed, and the primary care providers for those patients. Access to the list containing names, and social security numbers was limited to the sole researcher and destroyed. No data identifying the name, social security number, rank, telephone number or address of the individual s chart being reviewed was included on the Chart Review Checklist. Medical records were obtained from the outpatient record sections and were returned immediately following the chart review. Medical records were never removed from the outpatient record sections. Information from the medical records remained confidential. Data from the medical record reviews were compiled and reported in aggregate. No attempt was made to associate research findings with primary care providers.

Summary

This study conducted a chart review using a descriptive design to determine whether documentation of injury prevention counseling related to sports related injury on safety helmet use/protective gear was provided by health care providers. The pilot study determined the reliability of the checklist. Content-validity was established. A total of 51 records were reviewed. Summary statistics are displayed in tables in Chapter Four. Necessary caution was maintained to protect the confidentiality of the subjects, the providers, and the military medical treatment facilities.

CHAPTER IV: ANALYSIS

Presentation, Analysis & Interpretation of Data

The purpose of this study was to examine the current practices of health care providers in head injury prevention and counseling among active duty patients and beneficiaries between the ages of 18 and 44 years in Army outpatient care settings. This chapter presents the data collected on whether providers counsel on safety helmet use with individuals involved in a sports related head injury.

A chart review was utilized in examining selected records of patients in two military medical facilities. The total potential population consisted of 607 medical records of active duty and beneficiaries who were seen for head injuries between 1 January and 30 June 1999 in these facilities. The medical records were selected for review using the Composite Healthcare System (CHCS) under the following International Class of Diseases-9th Revision-Clinical Modification (ICD-9-CM) codes: 800-804 skull and facial fractures, 850 concussion, 851 cerebral laceration or contusion, 873 unspecified open wound of head and 959 unspecified head injury. Most of the 607 requested records (92%) were not available due to record transfers, retirements, or because they were checked out by the patient. The chart review consisted of 102 charts at an Army Ambulatory Care Center that met the inclusion criteria but only two were available for review. Neither of the two was sports related. Of a total of 505 potential records available at an Army Medical Care Center, 49 records were available for review, and of those, 15 met the established eligibility criteria described under methodology (see Figure 1).

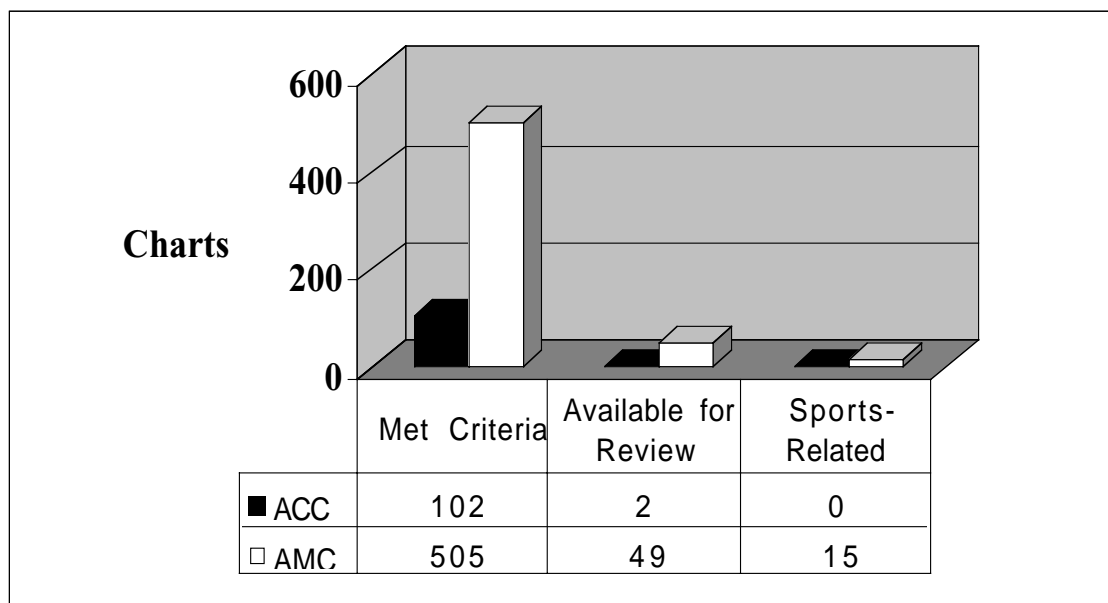


Figure 1.

Chart Review Results

Description of the Final Sample

The ages of the 15 patients in the final sample (n=15) ranged from 18 to 44 years with an average age of 27 years. Sixty percent were male and 40 percent female (see Table 1). Sixty percent of the eligible records came from the Emergency Room, 20 percent in the Primary Care Clinic and 20 percent in the Family Practice Clinic.

Table 1.**Age and Gender of Head Injury Patients Seen in Clinic**

	Emergency Room	Family Practice Clinic	Primary Care Clinic	Total	Percent
Age					
18-24	6	4	1	11	73.4
25-34	0	1	1	2	13.3
35-44	1	1		2	13.3
Total	7	6	2	15	100
Gender					
Male	5	2	2	9	60
Female	2	4	0	6	40
Total	7	6	2	15	100

Research Questions

To answer the main research the following results were posited from the research questions:

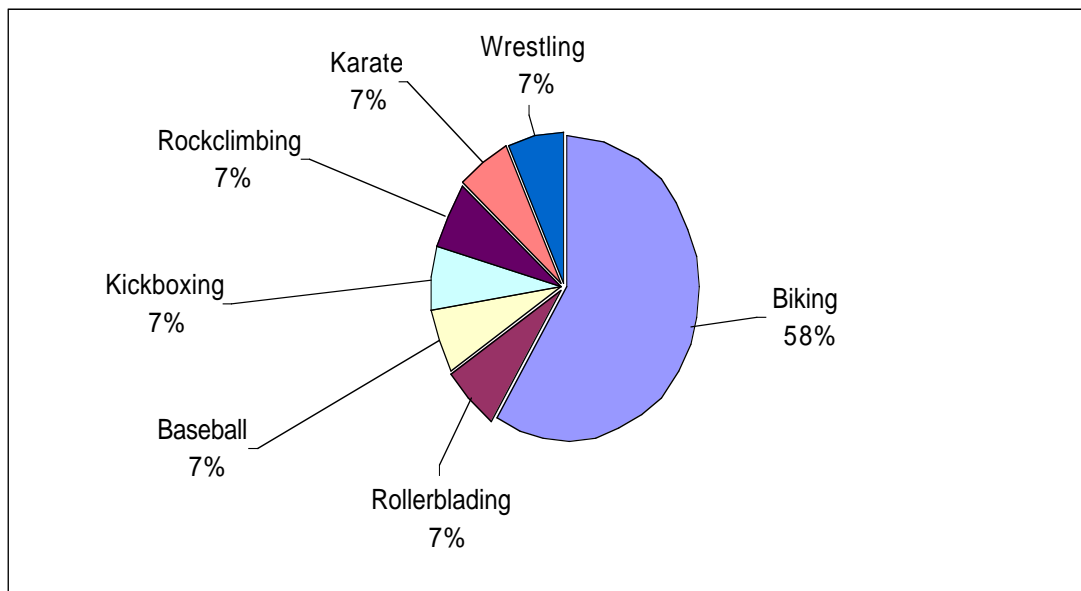


Figure 2.

Type of Sports Related Head Injury

Nine out of 15 (58%) individuals were involved in a bicycle related head injury (see Figure 2). The other sports related injuries involved activities for which safety helmets or other protective head gear would also be appropriate.

Date of Head Injury

The 15 sports related head injuries occurred and were treated within the specified time period (between 1 January 1998 and 30 June 1999). This period was used to limit the review to the most recent charts (in order to establish current efforts in provider counseling on safety helmet use).

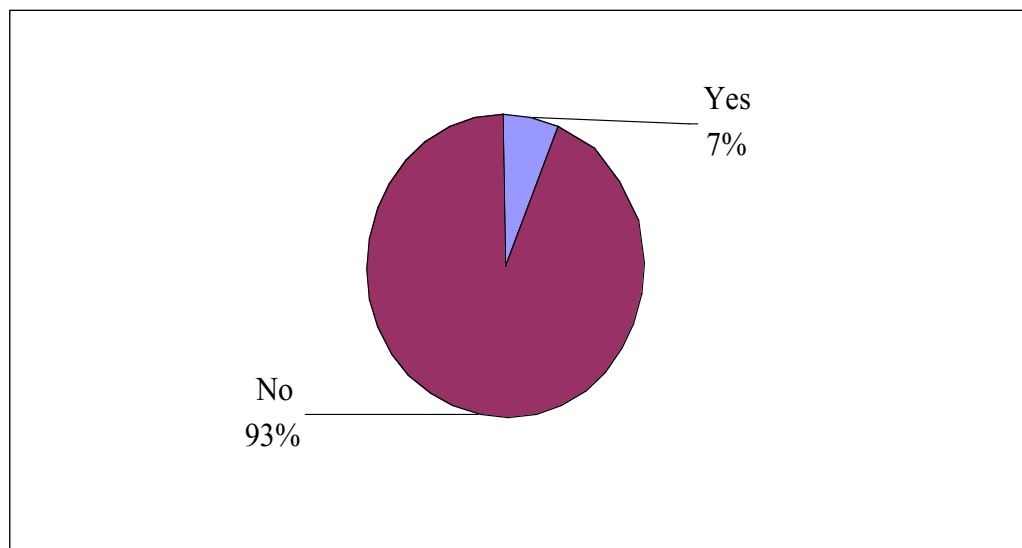


Figure 3.

Safety Helmet Use

Only one of the 15 patient records indicated a safety helmet was worn at the time of the head injury. There was no documentation in the other 14 medical records of safety helmet use by the patient.

Documentation of Injury Prevention Counseling

Of the 15 charts reviewed no head injury prevention counseling events were documented prior to the injuries. Each patient had one treatment visit for the head injury (15 total treatment visits in all). Of the 15 records reviewed, only two records revealed preventive counseling documentation at the initial treatment visit.

Provider Counseling

Each of the 15 patients was treated by a medical doctor. Only two patients received head injury prevention counseling provided by a medical doctor.

Opportunities for Injury Prevention Counseling

Following the head injury, the provider had full opportunity to counsel the patient at the time of initial treatment. However, there were no post head injury follow-up visits documented or ordered in any of the 15 medical records. Following initial treatment for each head injury, there was documentation of head injury preventive counseling in the record.

Number of Times Preventive Counseling was Documented Following Head Injury

Two patients in the study received head injury prevention counseling at the initial treatment visit. There were no documented visits after the initial treatment of the injury, and no further documentation regarding the head injury after the initial visit for any of the patients.

Outpatient Care Setting

Two individuals received injury prevention counseling. One was counseled in a Primary Care clinic, and one in a Family Practice clinic.

Summary

Medical records for a total of 51 patients met the criteria for inclusion in the study. Sixty percent of the records came from the Emergency Room, 20 percent from the Family Practice Clinic, and 20 percent from the Primary Care Clinic. Fifteen of the 51 records (29%) were for patients who had sustained a sports related injury. Only two of the 15 records (13%) contained documentation of head injury prevention counseling at the time of treatment for the head injury. One patient was counseled in the Family Practice Clinic and the other in the Primary Care Clinic. Since providers had ample opportunity to provide preventive counseling to the head injury patients at the time of the initial treatment and during any follow-up visits that could have been scheduled, the low incidence of such counseling found in this study suggests that room for improvement exists.

CHAPTER V: SUMMARY

Introduction

Health promotion and disease prevention are tools to improve the health of Americans. With the communication of Healthy People 2000 and Healthy People 2010 objectives, a strategic vision was provided in a national effort to improve the health of Americans (PHS, 1992). One of the objectives of Healthy People 2000 (PHS, 1992) was to encourage the use of safety helmets. This objective demands an increased effort to improve public awareness of safety issues related to the importance of safety helmet use. As part of this public awareness campaign, primary care providers are encouraged to educate their patients to prevent head injury. To establish compliance with the new health promotion and prevention focus, provider-patient interactions regarding health promotion and prevention need to be documented in patient medical records. The purpose of this study was to examine the current practices in head injury prevention and counseling among active duty patients and beneficiaries between the ages of 18 and 44 years in an Army outpatient care setting. Using a descriptive quantitative design, nine research questions were used to conduct a retrospective medical chart review of 51 patients.

Discussion

The first research question asked what sports related activity was the individual involved in when he or she received the head injury. In this study, injuries that occurred resulting in head trauma involved various sports activities: biking, rollerblading, baseball, kickboxing, rockclimbing, wrestling and karate. These

activities all increase the risk of head injuries. To lower this risk, safety helmets or other protective head gear are available.

The American Academy of Pediatrics Committee on Sports Medicine (American Academy of Pediatrics, p. 284) put together a list of recommendations to assist providers in allowing for participation in particular sports. The list divided sports events into groups depending on the degree of strenuous activity and the probability of collision. Kickboxing, wrestling and karate were grouped into a contact collision group. This group was at the highest risk of head injury with any type of collision. Biking, rollerblading and baseball were placed into limited contact impact, which had the same risk as the previous group but involved ground collision probability. Rockclimbing was not divided into a specific group. These groups were assessed using common medical and surgical injuries to determine whether participation would create a risk of injury (American Academy of Pediatrics, 1988). Changes in construction and design of the safety equipment, and the increase use of safety helmets over the last decade, have combined to prevent sports related injuries and allow for increased participation. In this study, nine out of fifteen (58%) individuals were involved in a bicycle related head injury. Biking had the highest incidence of sports related head injury compared to other sports.

Research question two addressed the date of the injury. The dates of 1 January 1998 to 30 June 1999 were used to select persons involved in sports related head injuries and treatment provided during this time frame. This period was used to

limit the review to the most recent charts to establish current efforts in counseling on safety helmet use.

Research question three asked whether the individual was wearing a helmet when the head injury occurred. The results show that only one of the 15 patient records indicated a safety helmet was worn at the time of the head injury. From the literature review, studies have shown that there are 67 million bicyclists in the United States with 900 deaths occurring annually (Mock et al., 1995). Whether bikers have to wear helmets is under state control. The District of Columbia, Maryland, Virginia and 20 other states require all riders to wear safety helmets (Skrzycki, 1999).

Helmets are about 29 percent effective in preventing motorcycle and bicycle related deaths and about 67 percent effective in preventing brain injuries. A rider without a helmet is 40 percent more likely to suffer a fatal head injury, compared with a helmeted rider (PHS, 1992,). Injury prevention counseling promotes risk awareness and stresses the importance of safety helmet use to save lives.

Research question four asked the age of the individual when the head injury occurred. The sample was specifically limited to active duty army personnel and beneficiaries between 18 and 44 years of age. Unintended injuries was one of the leading causes of death in this age group (DoD, 1998)

Research question five asked whether there was documentation of injury prevention counseling in the outpatient record between 1 January 1998 to 30 June 1999. Of the 15 charts reviewed there was no documented head injury prevention counseling prior to the injuries. Only two records had preventive counseling

documentation at the initial time of injury. There were no follow up visits documented in any of the charts. Individuals should receive special counseling about the importance of regular prevention strategies to decrease the risk of any form of head injury. Patients may be motivated to wear helmets if the provider counsels and informs the individual of the lethal and disabling nature of head injuries and the efficacy of safety helmets (Woof et al., 1996). The primary care provider is in the best position to counsel individuals on health behavior. Studies on head injury suggest that prevention campaigns have been effective in both changing behavior and reducing the occurrence and severity of injury. Studies have also shown that counseling on head injury prevention fell behind other health risk counseling (Diamond & Macciocchi, 1998). It is possible that verbal counseling occurred with individuals who were involved in a sports related head injury, but documentation was not reflected in the medical records.

Research question six asked what type of provider (RN, APN, PA, MD, DO) documented injury prevention counseling involving the head injury patient. Each of the fifteen individuals involved in a sports related head injury was treated by a medical doctor. Of the 15 clients, only two received head injury prevention counseling by a medical doctor. All providers with credentials and training to provide direct patient care and ongoing health promotion and disease prevention may provide counseling to individuals related to sports related injuries. Since only two medical records contained documentation of counseling, an adequate assessment of different provider counseling could not be obtained.

Research question seven asked how many opportunities for counseling did the provider have with the head injured patient following the injury. Following the head injury, the provider had full opportunity to counsel the patient at the time of initial treatment. There were no post head injury follow-up visits documented or ordered on any of the 15 medical records that met the inclusion criteria. Counseling may have taken place verbally between the provider and the patient and not actually documented in the medical record. The data suggest that the providers may have missed an important opportunity to discuss at-risk behaviors and promote healthier lifestyles among the injured patients.

Research question eight addressed how many times preventive counseling was documented following the head injury. Two out of the 15 patients received head injury prevention counseling at the initial time of the injury. There was no further documentation regarding the head injury following the initial visit for any of the patients. It is hypothesized that, in general, counseling on head injury prevention is provided significantly less frequently in the primary care setting than education on other risk behaviors related to heart disease, diabetes, smoking, cancer, alcohol and sexually transmitted diseases (Diamond & Macciocchi, 1998). It is recommended that primary care providers verbally counsel their patients on preventing head injuries and to document the counseling in the medical record. Primary care providers are recommended to educate patients and document preventive counseling involving sports related head injuries.

Research question nine asks what type of setting did the head injury prevention counseling occur. Two out of the 15 individuals who received treatment for their head injury were counseled on injury prevention in a Primary Care Clinic and a Family Practice clinic. In the outpatient care setting, the objectives of preventive counseling are to improve health practices, address a patient's at risk behavior and promote continuity of care for patients.

Conclusion

Of the total records requested from two military medical facilities for review, 92% were unavailable at the time of the chart audit. There are several reasons for such a high incidence of unavailable patient records in the military environment. First, active duty members and their families are transferred to new assignments every two to three years which contributed to decreased records available for a retrospective chart review. Second, records may be signed out for appointments, and thus unavailable at the designated time for review. Finally, records not required to be filed in the outpatient records may be maintained by the patient due to the fear of having the record lost and to avoid the inconvenience of drawing the medical record at each visit. Having this large percentage of records not available for review can hinder continuity of care by providers.

Recommendations

The chart review was specifically limited to active duty soldiers and beneficiaries between the ages of 18 and 44 years. Fewer than 10% of the charts for patients in this category with head injuries seen during the time period of 1 January

1998 and 30 June 1999 were available for review. According to results, documentation of head injury counseling (13.3%) and safety helmet use (6.7%) is extremely low in the military medical facilities.

Health care providers' ability to motivate health promotion and injury prevention behaviors can be explained by Nola Pender's behavior theory model. Primary care providers need to be more proactive in counseling patients before and after a sports related injury. Pender described cognitive-perceptual factors, which acted as primary motivational mechanisms influencing health promotion activities.

Cognitive-preceptual factors included perceived importance of health, perceived health control and self-efficacy, perceived health status, perceived benefits of the health promoting behavior and perceived barriers. Using this model, health professionals constitute a part of the interpersonal environment of a patient which exerts influence throughout their lifespan (Pender, 1996). With effective counseling on head injury prevention in reducing head injuries, prevention campaigns may be more effective in both changing behavior and reducing the occurrence and severity of injury. Studies have shown that counseling on head injury prevention was provided less frequently in the primary care setting than education on risk behaviors related to other disease states (Diamond & Macciocchi, 1998). Strategies are needed to educate primary care providers on head injury in order to increase their efforts toward prevention.

Future Research

This study suggests the need to influence education and preventive counseling of primary care providers. Subsequent studies should focus on strategies for increasing sports related head injury prevention counseling in outpatient care settings. The chart review was limited because of the unavailability of medical records. Because of lack of documentation in the records, the methodology should include a telephone survey of persons identified as having sustained a sports related head injury. With direct contact with the patient, a better assessment of whether verbal counseling took place between the patient and the primary care provider could be made. As noted in the review of literature, research still needs to be done to evaluate the relationship between preventive counseling among providers and the effect on sports related head injuries.

Summary

When a large percentage of medical records is unavailable the continuity of care among different primary care providers is questionable. The results from this study revealed a lack of documented counseling in preventing sports related head injuries. This lack is of great concern since the patients were involved in sports related activities. Head injuries cause significant morbidity and mortality. Because these injuries are a serious public health problem, numerous attempts have been made to educate the public about them in order to reduce the incidence of brain injury. Results of interventions have been mixed according to the review of literature and the optimal mode of changing risk behaviors remain uncertain. Changing patient

behavior through effective education and preventive counseling has been identified as an important strategy for reducing the risk of head injuries. Since primary care providers are in a position to educate their patients on a variety of health risks and preventive measures, counseling of patients on head injury prevention should be included in routine health maintenance. The data obtained in this study suggest that prevention strategies for head injury are discussed much less frequently than needed. Strategies for educating primary care providers on head injury should be considered in order to increase their efforts toward prevention. Administration of preventive counseling by health care providers will further improve the quality of care, promote a healthier lifespan and reduce the high health care costs of sports related head injuries.

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APPENDICES

APPENDIX A:	Chart Review Checklist
APPENDIX B:	IRB Review and Approval of Protocol T061AL-01 for Human Subject use

APPENDIX A

Chart Review Checklist

1. Is the head injury sports related?

_____ yes _____ no (if no, discontinue survey of this record)
 - a. If yes, what sport? _____
2. What date did the head injury occur? _____
3. Was the individual wearing a safety helmet at the time of the head injury?

_____ yes _____ no
4. What age was the individual at the time of the head injury? _____
5. What gender is the individual? _____ male _____ female
6. Is there documentation of injury prevention counseling during the outpatient visits between 1 January 1998 and 30 June 1999?

_____ yes _____ no
 - 6a. If yes, did the counseling occur before or after the head injury?

_____ before _____ after
 - 6b. If yes, who did the counseling? (circle one): RN APN PA MD DO
7. How many opportunities for counseling on injury prevention did the provider have with the head injury patient following the head injury?

_____ 0-3 _____ 4-6 _____ 7-9 _____ 10 or
more

8. How many times was there documentation for injury prevention counseling following the head injury?

_____ 0-3 _____ 4-6 _____ 7-9 _____ 10 or more

9. Which outpatient care setting did the counseling on injury prevention occur?

_____ primary care _____ family practice _____ emergency room
_____ specialty clinic



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APPENDIX B

May 27, 1999

MEMORANDUM FOR SANDRA MCNAUGHTON, GRADUATE SCHOOL OF NURSING

SUBJECT: RB Approval of Protocol **T061AL-01** for Human Subject Use

Your research protocol entitled "*The Current Practice in Injury Prevention and Safety Helmet Use in an Army Medical Center,*" was reviewed and approved for execution on 5/27/99 as an exempt human subject use study under the provisions of 32 CFR 219.1 01 (b)(4). This approval will be reported to the full IRB scheduled to meet on June 10, 1999.

The purpose of this study is to examine the current practices in head injury prevention in an Army outpatient care setting. This study will examine whether providers give education and counseling on safety helmet use as part of outpatient visits with individuals that have received a sports related head injury. Outpatient medical records of individuals that experienced a sports related head injury will be reviewed and information will be recorded regarding the type of injury prevention counseling provided. The IRB understands that no subject identifying information will be collected as part of this study.

Please note that to complete the file for this protocol you are required to provide this office with a copy of the Walter Reed Army Medical Center approval for this study once it is received.

Please notify this office of any amendments you wish to propose and of any untoward incidents which may occur in the conduct of this project. If you have any questions regarding human volunteers, please call me at 301-295-3303.



Richard R. Levine Ph.D.

LTC, MS, USA
Director, Research Programs and
Executive Secretary, IRB

Cc: Director, Grants Administration